UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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Carrier

August 14, 1991

MEMORANDUM

Subject: Carrier Air Conditioning Site
Collierville, TN

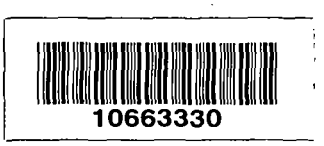
From: Candida West, Environmental Scientist CW
RSKERL

To: Beth Brown, Remedial Project Manager
North Superfund Remedial Branch
Waste Management Division

Thru: John Matthews, Chief JM
Applications and Assistance Branch

I have reviewed the final RI and am submitting my comments for consideration. This RI is vastly improved over the draft. I find the understanding of the problem of contamination by a dense, non-aqueous phase contaminant to be better perceived. The primary conclusions that the TCE contamination appears to be contained within residual phase near-surface is well premised based on the age and quantity of the original spills and the current soil and water analyses for chlorinated products. It is unfortunate that the situation was complicated by the fact that one of the spills was hosed off, consequently spreading the source over a larger surface area.

Microbiological Activity: The water chemistry analyses conducted for monitoring wells 05, 13, 29, 1B, 14, and 16 (not included in the RI, but sent to me separately by request) do not conclusively show that biodegradation of the TCE to DCE and other products is occurring, but there are suggestions that this may be the case. For instance in well 29 the reduced levels of dissolved oxygen, sulphates and pH coupled with the availability of ammoniacal nitrogen and phosphates and the presence of DCE may be indicative of dehydrohalogenation of the TCE in this area. Since the main thrust of the remediation plan does not include biodegradation, it is probably inappropriate to require any further testing of these water parameters. However, the



recognition in the RI that natural biodegradation may be occurring and be responsible for DCE levels is important.

✓*Metals Contamination:* I think there are two important observations to be made concerning the metals data. The first is that the metals concentrations are variable and sometimes high in the control wells. Secondly, the metals concentrations in the on-site wells are also variable but the range is higher than off-site. The fact that the metals are of such a wide variety including several that could not possibly be a result of the Carrier operations suggests that there may be a change in the local chemistry elevating the concentrations of soluble metals from soils that are naturally high in metals. The most probable candidates for such a change would include a reduction in pH as a result of dehydrohalogenation (with a concomitant release of hydrochloric acid), a change in the redox potential of the system, and/or direct release due to microbiological activity. It is interesting to note that wells numbered 29 and 16 both exhibit relatively low pH (5.8) and both have higher metal concentrations than wells 5, 13, 1B, and 4, although well 29 has higher levels of more metals than well 16. In conclusion, it appears that high levels of metals on the Carrier site are a secondary effect of the TCE contamination/degradation and are not a result of direct release of metals, except perhaps for beneath the surface impoundment where zinc compounds were disposed. As the TCE is remediated and the ground water chemistry returns to it original status the levels of metals in the water should drop.

✓*Fate and Transport of TCE:* While I was somewhat disappointed that soil total organic carbon measurements from the soil borings were not included in the final water/soil chemistry, I was pleased to that the RI does reflect a much better understanding of the primary fate and transport mechanisms for TCE. It is now recognized that the greatest portion of the TCE mass is tied up as residual phase that continues to bleed into the aqueous phase and that sorption of this relatively soluble compound is not of real significance.

Discussed w/ Don Hunter. Not applicable @ Superfund sites.

X *General Comments:* I noted that in the shallow wells dedicated bailers were used. Recent research has shown that bailers often introduce colloidally carried artifacts due to surging of the wells when the bailer is withdrawn. While initially the use of dedicated bladder pumps in all wells is more expensive, over the long haul the costs of dedicating the pumps may be cheaper by collection of more accurate and precise data, thereby requiring less sampling to be conducted. While this may have no direct

bearing at this particular site, it may be of use for other sites the contractor is involved in.

✓Page 53: The second paragraph is a repeat of the previous paragraph.

✓Page 99: Please, there is no such thing as a soil/sediment adsorption coefficient. Distribution coefficients describe how a chemical partitions itself between two phases. The denominator is always the water or fluid phase and the numerator is whatever the second phase is. For example, the octanol/water partition coefficient described in the previous paragraph quantitatively describes how a chemical partitions itself between octanol and water. There is a soil/water and a sediment/water partition coefficient, but there is differentiation between how a chemical partitions between soil and sediment. Additionally, adsorption implies that the mechanism of sorption is clearly adsorption, which is not clearly known. That is why the terms sorption and partitioning are commonly used - because they do not imply any particular mechanism of sorption.

If I can be of any further assistance, please let me know.

cc: Rich Steimle, OS-110W
Gallo Jackson, Region 4
Douglas Bell, Region 4
John Montanari, Region 4
John Risher, Region 4
Dick Scalf, RSKERL